

Transcript



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Venus Liao

Good afternoon and good morning, too. Wherever you're based, welcome to Swinburne Webinar Series on a Friday afternoon. My name is Venus Liao. I'm the Regional Recruitment Manager from Swinburne University. I'm responsible for onshore international student recruitment. I'm based in Melbourne, Australia.

As you can see, it's a sunny day in Melbourne today. And this is where our AMDC and ATC buildings are located on campus. We're not far from Melbourne CBD.

I hope you're all doing well and keeping healthy. Thank you for joining us today for virtual training on Swinburne Mechanical Engineering. This is part of the Swinburne Webinar Series I'm running from the months of May to July.

On your right-hand side are the panellists for today's webinar-- Professor Tracy Dong Ruan, Department Chair for Mechanical and Product Design Engineering, and Mahdi, International Recruitment Manager on the Faculty of Science, Engineering, and Technology at Swinburne University.

Professor Tracy will be sharing with us today about how COVID-19 has impacted this course, how we as a university are preparing our students, dealing with the impact of global pandemic, and future scenarios. Also, projection of emerging jobs in mechanical and product design engineering.

If you have any questions during the presentation, please type your question in the Q&A box down below. At the end of the webinar, we will leave 5 to 10 minutes to go through the questions together. If we can't answer your questions today, please feel free to contact Mahdi or your regional recruitment managers at Swinburne University.

Without further ado, I would like to introduce today's presenter, Professor Tracy Dong Ruan, Department Chair for Mechanical and Product Design Engineering from Swinburne University. Thank you, Tracy.

Tracy Dong Ruan

Thank you, Venus. Good morning or afternoon or evening, wherever you may be. Welcome to this webinar about Mechanical and Product Design Engineering. My name is Dong. I'm department chair of Mechanical and Product Design Engineering at Swinburne University of Technology.

Today, I'm going to talk about the Mechanical and Product Design Engineering at Swinburne-- share our learning and teaching approaches. I will also talk about our courses at all levels, including undergraduate, postgraduate, and research. I will discuss the career opportunities and how they are impacted by COVID-19. Lastly, I will share the reasons to study at Swinburne.

Mechanical engineering is to design, analyse, manufacture, and maintain engineering systems involving motion. It combines engineering, physics, and mathematics principles. It is one of the oldest and the broadest of engineering branches. It has core subjects, including material sciences, manufacturing, Newtonian mechanics, fluid flow, energy, and many others. My understanding of the mechanical engineering and civil engineering is that mechanical engineering is about something that moves such as wind mills, vehicles, and machines, while civil engineering is about something that does not move such as buildings, bridges, and other infrastructures.

Mechanical engineering students in their first and second years will study structures, dynamics, thermodynamics, flow mechanics, control theories, and other units. Students will have opportunity to design and build objects to apply their learning. For example, in a unit called Machine Design, students will fabric an acrylic gearbox. In another unit, Mechanical System Design, students will design, fabricate, and test solar boats.

Mechanical engineering students in their final years will bring all their knowledge together to work on their final year projects. A very popular final year project at Swinburne is formula SAE cars. Students design, build, and test their own vehicles. Swinburne as a team performed very well in FS-Sydney competition early this year. The team was awarded the Best Presented Team of the competition, the second place in EV acceleration, the third for the best overall electrical vehicles.

Academic staff offer many projects for the students to choose and work on. Examples include 3D printing and optimisation, advanced nano materials, characterisation of materials and dynamic loading, high-temperature materials, surface coating, surgical robots, and Industry 4.0. One COVID-19-related project is the respiratory flows and assisted ventilation.

Here, I'm going to show you a video which showcases a project that carried out by master engineering students as part of their final semester master's thesis unit in 2019. This is called the mind-controlled wheelchair for people with disability.

[VIDEO PLAYBACK]

- Make a right turn. Once more. Now, keep it straight.

[END PLAYBACK]

Tracy Dong Ruan

This mind-controlled wheelchair has two main parts. The first is a headset which has built-in Bluetooth. The second is an arduino which controls the moment. Once integrated with the arduino,

the headset sends the signals via Bluetooth to the arena, so it can control the movements of the wheelchair.

Product Design Engineering is Mechanical Engineering plus human-centred design. It is the design of products that are operable and stimulating to users. This course is suitable for students who like both creative, innovative work and science. This course is unique in Australia, so it is very popular.

Our department's prestigious Product Design Engineering program worked closely with the School of Design. This course provides the fundamental knowledge and skills needed to create products that are sustainable and innovative, technologically sound, and appealing to users. Students will gain expertise in advanced digital technology, production method, and materials relevant to industry. Graduates have excellent career to look forward to in industry that specialise in the design, development, manufacturing of products and complex systems.

Product design students in their early years will study 50% design project units and 50% engineering units. Design studio work includes project-based classes, computer design, workshop practice, model making, and design theory lectures. Engineering studies include engineering theories, computer design, and laboratory work.

Product Design Engineering students in their final years will work with an industry client on real-life design problems. They will deliver work from creative ideas down to the details, ready for manufacturing. Students have the opportunity to find industry partners they prefer, which will help them to set up their future career. Below, three images show examples of the projects that previous students worked on.

Here is a video showcasing the Product Design Engineering at Swinburne.

[VIDEO PLAYBACK]

[MUSIC PLAYING]

- The real unique point about Product Design Engineering at Swinburne is that it combines industrial design and engineering. Most importantly, it combines those in the same subjects. So there are design subjects, where students are expected to apply engineering and design at the same time. And typically, that doesn't happen in-- well, any other degree, in Australia at least.

- You can draw whatever you want and imagine whatever you want. But you need to know how you're going to manufacture it. And you need to know what materials you can use or what limitations there are, the environmental impact producing the product can have, and all those sort of elements. And also, safety concerns, technical concerns-- all those elements. Having that engineering knowledge and background is so helpful when creating a product.

- Swinburne I found to be a more practical university. I really enjoyed the atmosphere. When I came to Swinburne Open Days, I always was greeted with people who were genuinely interested in me and wanting to know about me, not just about what subjects I did and how well I am doing and all of that. One of the things I love about doing my course is that it's so broad what you can do with it afterwards. The skills that you learn are so valuable that you can almost walk into any place and say, I could do this. I could do this. I can do this, and I can help you out. You need me.

- I think students, when they're looking at going to university, might be under the impression that either they go down a very technical path, and they have to leave behind the creative subjects, or vice versa-- they go down a creative path, but they forget about the technical stuff. And, yeah, I guess the advice would be that you don't have to choose. And there's a lot of potential for combining those two. So you don't have to be just a designer or just an engineer. You can be a product design engineer. That's too much.

[END PLAYBACK]

Tracy Dong Ruan

Students need to meet the entry requirement in order to study courses at Swinburne. We offer pathways that allow students to study Bachelor of Engineering. Options are Associate Degree of Engineering, Advanced Diploma of Engineering Technology, Specialising in Mechanical Engineering, a one-year diploma of Engineering, which is also known as UniLink. We offer both single degrees and double degrees. Single degrees include Bachelor of Engineering, Honours, Professional, and Bachelor of Engineering, Honours. Both courses have majors in either Mechanical Engineering or Product Design Engineering.

We offer double degrees. Options include Bachelor of Engineering, together with Bachelor of Business or Bachelor of Computer Science or Bachelor of Innovation and Design or Bachelor of Science or Bachelor of Law. Students can select minors from other disciplines. If the students would like to move on to postgraduate study, they will gain credits, and they can complete our related master qualification in just one year.

We offer three master courses. The first is the Master of Engineering. We have specialisations in either advanced manufacturing or mechanical engineering. The second is Master of Engineering Science. We also have specialisations in either advanced manufacturing or mechanical engineering.

The third one is the Master of Professional Engineering. Students will learn both technical and management units in this course. Students may become a project manager after they graduate. We offer two research two degrees. One is the Master of Engineering by Research. The second is the PhD.

When mechanical students graduate, they can find positions in many places. According to the data on government website job articles, 30% of mechanical engineering graduates working in manufacturing sectors. The pie chart on the right-hand side shows more detailed distribution. Jobs directly relating to mechanical engineering degrees include engineers in aerospace, automotive, contracting, control and instrumentation, maintenance, mining, and nuclear sectors.

Other positions include consultants, patent attorney. Graduates may find positions in insurance firms. They may evaluate engineering failure. For graduates who are good at math, they may find positions in finance. Our graduates may become senior manager after promotion.

Our Product Design Engineering is unique in Australia, so our graduates are very popular and in demand. An engineering and design degree can take you many places, including cross-disciplinary engineering jobs, senior management, innovation, and product management. Graduates may run their own business. They may become intellectual property lawyer, or they can move on to graduate program. The companies that our graduates have worked at are listed on the right-hand side. They are the selected ones.

Opportunities in the post COVID-19-- the devastating spread of COVID-19 affects all nations, all industries, and all professions, bringing many challenges, but also opportunities. More cross-disciplinary and cross-organisational collaborations have been observed. There are even collaborations among previous competitors. More efficient approach to helping employed. Engineers act quickly to make a decision, source supply chain, create prototypes, complete devices such as ventilator and the personal protective equipment in very short time.

We may have new focus in the future. After COVID-19 pandemic, there will be increased demand for engineering that fights, prevents, and treats diseases, such as ventilator, antibacterial surfaces, temperature-monitoring device, and other high-tech solutions. Some companies might make a permanent shift towards technology that helps save lives.

Swinburne has helped the community in this challenging time. Students and the staff have utilised their knowledge in material science, fluid mechanics, and manufacturing to provide professional advice and assistance to industries in selecting materials for ventilators, designing and installing ventilators. Swinburne has worked with the manufacturer [...] 3D to 3D-print and try copper push plate to fight COVID-19. Tests have shown that antibacterial copper plate can kill 96% of virus that causes COVID-19 in just two hours, while virus may last days on plastic and steel push plates. Swinburne team also worked with Able Australia to mass print over 1,000 mass shield to help protect COVID-19 transmission among workers in the disability sector.

Why study at Swinburne? There are many reasons to study at Swinburne, including good ranking, excellent educational experience, and the high employment rate. Swinburne has been ranked the top 50 universities under 50 years old. Moreover, Swinburne has received a five-star overall experience rating for the second consecutive year in the Good University Guide, 2020. This five-star rating placed Swinburne in the top 20 universities in Australia.

Students have excellent education experience at Swinburne. More than 81% of Swinburne students report satisfaction with the quality of the teaching they experience at Swinburne. More than 80% of Swinburne graduates report they were satisfied with the overall quality of education experience at Swinburne.

Swinburne offers many scholarships for its students. The most prestigious is the Vice Chancellor's Scholarship, where students are awarded up to \$5,000 annually. International students are eligible for consideration. Other scholarships include George Swinburne STEM Postgraduate Scholarship, Swinburne International Excellence Pathway, undergraduate, postgraduate, and postgraduate scholarship. For more details, please visit the following website.

Swinburne offers support for students through programs such as MASH, which is available five days a week from 9:00 to 5:00. There are also mentors and rovers who offer peer-to-peer academic support. Connect Study Group help first-year students transition into universities. There are also many social events organised by Swinburne, such as the International Student Welcome and the Burn Out Event. Swinburne has specialised engineering groups, including Women in Engineering, Engineers Without Borders, Engineers Australia's Women's Chapter, Team at Swinburne Formula SAE, and the Swinburne 3D Printing Club and many others.

We offer international exchange program. There are more than 100 international partner institutions in over 20 countries to choose from. Students can spend one or two semesters overseas.

Swinburne also offers study tours, which is between two to six weeks, where students learn skills for their career. This is a unique cultural experience. Swinburne has a campus in Sarawak, Malaysia, where students can study or exchange for one or two semesters.

According to QILT, our graduate employ rate upon the graduation is high. 2019 Graduate Outcome Survey shows that Swinburne's graduates' employ rate is high, more than 22% full-time employment and about 86% overall employment. The diagram shown here is the undergraduate median full-time salary in Australia. The pink column is the average employee salary of all Australian universities. And the yellow highlighted university is Swinburne. Swinburne's undergraduate median full-time salary is above the average in Australia, which is \$60,000 per year.

Mechanical and Product Design Engineering at Swinburne is ranked top 200 by ARWU in 2019 and 2020. This is the number 11 in Australia this year. Mechanical engineering is also ranked top 200 by Times Higher Education this year. One key feature of our undergraduate course is the work integrated learning which turns knowing into know-how. Options for our degrees include paid professional placement, professional internship, industry link project, and industry study tours.

At Swinburne, we offer a practical curriculum developed in partnership with industry. We have a wide range of specialisations available through the unique units developed and offered by experienced staff. Swinburne graduates, engineering graduates, have a high employ rate upon graduation. So that's about more than 86%.

For Product Design Engineering, this has been consistently higher than 90% in the previous year. Mechanical engineering at Swinburne-- we have world-class laboratories. These include the High-temperature lab, the Impact Engineering Lab, the Microfabrication Lab, Solar, Thermal Research Lab, Energy Transformation Lab, Virtual Design Lab, and the Factory of the Future, all at Additive Manufacturing Laboratory.

Mechanical and Product Design Engineering department has 25 academic staff, including 10 professors, seven associate professors, five senior lecturers, and three lecturers. We also have quite a few teaching-intensive colleagues. We have more than 530 undergraduate students, 210 master by coursework students. We have more than 120 postgraduate research students, including PhD and master by research students.

We are affected by COVID-19, so we offer all our courses and units online in semester one. In the coming semester, both lectures and tutorial will be offered online using the tools such as Collaborate Ultra in Canvas. We will run essential practice sessions on campus when it is possible.

I would like to thank colleagues Akbar and Boris for their contribution to this presentation. Thank you very much for your listening. If you have any question, please feel free to contact us at any time. Thank you.

Venus Liao

Thank you very much, Tracy, for a wonderful presentation on Swinburne Mechanical and Product Design Engineering. I would now like to open to Q&A session. If you have any questions on the presentation today, please feel free to type your question in the Q&A box down below. And while we're waiting for the questions to come in, Mahdi, can I just get you to give us an update about scholarship information?

Mahdi Shariatian

Sure. Thanks, Venus, for the opportunity. And thanks, Tracy, for this amazing presentation. I couldn't believe my eyes seeing the wheelchair working by itself under the command of that student. It was amazing.

It is all about the opportunity, as you said, Tracy, for the students. And this is the mission of Swinburne-- to provide the opportunity for students to study with us. And that's why we have introduced this amazing and very generous 30% scholarship for any student who wishes to study at our postgraduate engineering programs.

So we have two programs in engineering, Master of Engineering Science and Master of Professional Engineering. In both, you can do majors in mechanical engineering or mechanical engineering design in [...] professional engineering. The entry requirement to that is very simple. As long as a student meets the entry requirement for the program, they receive the 30% scholarship in their offer letter.

And you're probably aware of our revamped International Access Scholarship for our undergraduate programs. We offer from 10% to 75% scholarship for high-achieving students. So please make use of this opportunity. Submit the applications as soon as possible. And we're going to be here for another four or five minutes, Venus, if there's any questions.

Venus Liao

Thank you very much, Mahdi. We haven't seen any questions coming in. But I do really enjoy watching the two videos provided by you, Tracy. It's amazing to see how a student is creating amazing products.

And a lot of students have asked me to study about design program. And they learn that they can actually study to-- so design plus engineering is a combined degree. They haven't seen this combined degree elsewhere in Australia as well. They definitely told us it's very unique in Swinburne.

Tracy Dong Ruan

Yeah, it is true. Thank you very much for the opportunity to allow me to present the wonderful work that our students have conducted previously. Yeah, we are very--

[INTERPOSING VOICES]

Tracy Dong Ruan

We are very proud of their excellent work and great achievements. Yeah.

Venus Liao

Yeah. Maybe, Tracy, can you tell us about how semester two will look like for students enrolling into engineering program if they are in Australia?

Tracy Dong Ruan

OK. As I mentioned, all the lectures and tutorials will be offered online. So basically, we'll use Canvas, the Collaborate Ultra, or Echo360 to either run the synchronised or asynchronised lecture and tutorials. So students, basically, they can watch the videos or join the synchronised sections when they are available. Yeah.

For some labs, especially for mechanical engineering, we would like to offer these labs on campus, so students will have some hands-on training. So they can operate the device. They can do the measurements themselves, and they can finish their lab report.

So we've already finished the paperwork to run the labs on campus. but it depends on the situation. If the situation is getting better, then students will be allowed to access campus. We'll run them on campus.

But if the situation is not getting better, we will have a backup plan. We'll make the recordings of all the labs. Then we'll offer them online so students can watch the video. Then we'll run the synchronised consultation time to answer students' questions and help them to complete their reports.

Venus Liao

Thank you very much, Tracy. Obviously, Swinburne University is putting our students' safety and well-being as the most important and foremost priority. So if it is the plan to reopen the campus for semester two study, obviously we will follow all the required [...] and do it under the strict social distancing and restriction or not.

All right, let's see. There is a message coming in the chat box. Thank you very much. It's from Okito, just thanking everyone for giving a clear information. Thank you. On the panel, we can see we have a visitor here-- maybe someone from our team. Oh.

[LAUGHTER]

Mahdi Shariatian

Well.

Venus Liao

All right. Looks like it's a very clear presentation today. We've got--

Tracy Dong Ruan

Good.

Venus Liao

That's good, exactly.



Tracy Dong Ruan

Good. Thank you again, Venus and Mahdi, for organizing this wonderful opportunity for me to present our department.

Venus Liao

It's our pleasure. Thank you very much, Tracy.

Mahdi Shariatian

Thanks, Tracy. Thanks for your time.

Tracy Dong Ruan

Thank you.

Venus Liao

I might bring today's session to the end. It seems we haven't got any questions coming in. Thank you, Tracy, for your wonderful presentation on Swinburne Mechanical and Product Design Engineering. And thank you to our participants for following this webinar series from May to July.

We are concluding the series today, as we have brought you the last session. Also, good work to our team, Wendy, Lyndon, Karen, Michelle, and Rodrigo, the regional recruitment managers-- also, Mahdi, Justin, Zoe, and Bruce, our faculty managers, for working together on this project. Today's presentation will be emailed to you. We hope to see you around soon in our next webinar series. Take care, everyone. Goodbye.

Mahdi Shariatian

Thank you.

Tracy Dong Ruan

Thank you. Take care. Bye.

[END OF TRANSCRIPT]